

*On the Ikonomatic Method of Phonetic Writing, with Special Reference to American Archæology. By Daniel G. Brinton, M.D.*

(Read before the American Philosophical Society, October 1, 1886.)

All methods of recording ideas have been divided into two classes, Thought Writing and Sound Writing.

The first, simplest and oldest is Thought Writing. This in turn is subdivided into two forms, Ikonographic and Symbolic Writing. The former is also known as Imitative, Representative or Picture Writing. The object to be held in memory is represented by its picture, drawn with such skill, or lack of skill, as the writer may possess. In Symbolic Writing, a single characteristic part or trait serves to represent the whole object; thus, the track of an animal will stand for the animal itself; a representation of the peculiar round impression of the wolf's foot, or the three-lined track of the wild turkey, being amply sufficient to designate those creatures. Even the rudest savages practice both these forms of writing, and make use of them to scratch on rocks, and paint on bark and hides, the record of their deeds.

It will be observed that Thought Writing has no reference to spoken language; neither the picture of a wolf, nor the representation of his footprint, conveys the slightest notion of the sound of the word *wolf*. How was the enormous leap made from the thought to the sound, in other words, from an ideographic to a phonetic method of writing?

This question has received considerable attention from scholars with reference to the development of the two most important alphabets of the world, the Egyptian and the Chinese. Both these began as simple picture writing, and both progressed to almost complete phoneticism. In both cases, however, the earliest steps are lost, and can be retraced only by indications remaining after a high degree of phonetic power had been reached. On the other hand, in the Mexican and probably in the Maya hieroglyphics, we find a method of writing which is intermediate between the two great classes I have mentioned, and which illustrates in a striking manner the phases through which both the

Egyptian and Sinitic alphabets passed somewhat before the dawn of history.

To this method, which stands midway between the ikonographic and the alphabetic methods of writing, I have given the name *ikonomatic*, derived from the Greek *εικων-ομοσις*, an image, a figure; *ονομα-αποσις*, a name. That which the figure or picture refers to is not the object represented, but the *name* of that object—a *sound*, not a *thing*. But it does not refer to that sound as the name of the object, but precisely the contrary—it is the sound of the name of some other object or idea. Many ideas have no objective representation, and others are much more simply expressed by the use of figures whose names are familiar and of similar sound. Thus, to give a simple example, the infinitive “to hide” could be written by a figure 2, and the picture of a skin or hide. It is this plan on which those familiar puzzles are constructed which are called *rebuses*, and none other than this which served to bridge over the wide gap between Thought and Sound writing. It is, however, not correct to say that it is a writing by *things* “*rebus* ;” but it is by the *names* of things, and hence I have coined the word *ikonomatic*, to express this clearly.

I shall select several illustrations from two widely diverse sources, the one the hieroglyphs of Egypt, the other the heraldry of the Middle Ages, and from these more familiar fields obtain some hints of service in unraveling the intricacies of the Mexican and Maya scrolls.

The general principle which underlies “ikonomatic writing” is the presence in a language of words of different meaning but with the same or similar sounds; that is, of *homophonous* words. The figure which represents one of these is used phonetically to signify the other. There are homophones in all languages; but they abound in some more than in others. For obvious reasons, they are more abundant in languages which tend toward monosyllabism, such as the Chinese and the Maya, and in a lesser degree the ancient Coptic. In these it is no uncommon occurrence to find four or five quite different meanings to the same word; that is, the same sound has served as the radical for that many different names of diverse objects. The picture of any one of these objects would, to the speaker of the language, recall a sound which would have all these significations, and could be

employed indifferently for any of them. This circle of meanings would be still more widely extended when mere similarity, not strict identity, was aimed at.

Such was plainly the origin of phoneticism in the Egyptian hieroglyphic inscriptions. Take the word *nefer*. Its most common concrete signification was "a lute," and in the picture writing proper the lute is represented by its figure. But *nefer* had several other significations in Coptic. It meant, a *colt*, a *conscript soldier*, a *door*, and the adjective *good*. The picture of the lute therefore was used to signify every one of these.

It will be observed that this is an example of a pure ikonograph. The picture is that of the object in full, a lute; but precisely in the same way the second class of figures in picture writing, those which are wholly symbolic, may be employed. This, too, finds ample illustration in the Egyptian hieroglyphics. Instead of the picture of a house, the figure of a square was employed, with one side incomplete. Phonetically, this conveyed the sound *per*, which means *house*, and several other things.

It will readily be seen that where a figure represents a number of homophonous words, considerable confusion may result from the difficulty of ascertaining which of these is intended. To meet this, we find both in Egyptian and Chinese writing series of signs which are written but not pronounced, called "determinatives." These indicate the class to which a word has reference. They are ideographic, and of fixed meaning. Thus, after the word *nefer*, when used for conscript, the determinative is the picture of a man, etc.\*

There is little doubt but that all the Egyptian syllabic and alphabetic writing was derived from this early phase, where the governing principle was that of the rebus. At the date of the earliest inscriptions, most of the phonetics were monosyllabic; but in several instances, as *nefer*, above given, *neter*, which represents a banner, and by homophony, a god, and others, the full dissyllabic name was preserved to the latest times. The

\* The following elements occur in the old Egyptian writing:

1. Ideographic.—(a) Pictures or ikonographs.  
(b) Symbols.  
(c) Determinatives.
2. Phonetic.—(a) Words.  
(b) Syllables.  
(c) Letters.

monosyllabic signs were derived from the initial and the accented syllables of the homophones; and the alphabet, so-called, but never recognized as such, by the Egyptians, either from monoliteral words, or from initial sounds. At no period of ancient Egyptian history was one sound constantly represented by one sign. In the so-called Egyptian alphabet, there are four quite different signs for the *M*, four for the *T*, three for the *N*, and so on. This is obviously owing to the independent derivation of these phonetic elements from different figures employed ikonometrically.

There are other peculiarities in the Egyptian script, which are to be explained by the same historic reason. For instance, certain phonetic signs can be used only in definite combinations; others must be assigned fixed positions, as at the beginning or at the end of a group; and, in other cases, two or more different signs, with the same phonetic value, follow one another, the scribe thinking that if the reader was not acquainted with one, he would be with the other. I note these peculiarities, because they may be expected to recur in other systems of ikonometric writing, and may serve as hints in interpreting them.

Evidently, one of the earliest stimuli to the development of phonetics was the wish to record proper names, which in themselves had no definite signification, such as those drawn from a foreign language, or those which had lost through time their original sense. In savage conditions every proper name is significant; but in conditions of social life, as developed as that of the Egyptians of the earliest dynasties, and as that of the Mayas and Mexicans in the New World, there are found many names without meaning in the current tongue. These could not be represented by any mode of picture writing. To be recorded at all, they must be written phonetically; and to accomplish this the most obvious plan was to select objects whose names had a similar sound, and by portraying the latter, represent to the ear the former. The Greek names, *Alexander* and *Alexandria*, occurring on the Rosetta Stone, were wholly meaningless to the Egyptian ear; but their scribes succeeded in expressing them very nearly by a series of signs which in origin are rebuses.

This inception of the ikonometric method, in the effort to express phonetically proper names, is admirably illustrated in mediæval heraldry. Very early in the history of armorial bear-

ings, we find a class of scutal devices called in Latin *arma cantantia*, in English *canting arms*, in French *armes parlantes*. The English term *canting* is from the Latin *cantare*, in its later sense of *chanting* or *announcing*. Armorial bearings of this character present charges, the names of which resemble more or less closely in sound the proper names of the family who carry them.

Some writers on heraldry have asserted that bearings of this character should be considered as what are known as *assumptive arms*, those which have been *assumed* by families, without just title. Excellent authorities, however, such as Woodham and Lower, have shown that these devices were frequent in the remotest ages of heraldry.\* For instance, in the earliest English Roll of Arms extant, recorded in the reign of the third Henry, about the year 1240, nine such charges occur, and still more in the Rolls of the time of Edward the Second. They are also abundant in the heraldry of Spain, of Italy and of Sweden; and analogous examples have been adduced from ancient Rome. In fact, the plan is so obvious that instances could be adduced from every quarter of the globe. In later centuries, such punning allusions to proper names became unpopular in heraldry, and are now considered in bad taste.

To illustrate their character, I will mention a few which are of ancient date. The well-known English family of *Dobells* carry a *hart passant*, and three bells *argent*, thus expressing very accurately their name, *doe-bells*. The equally ancient family of *Boltons* carry a device representing a cask or *tun*, transfixcd by a crossbow or *bolt*. Few canting arms, however, are so perfect as these. The *Swinburnes*, who are among those mentioned on the Roll of 1240, already referred to, bear three boar-heads, symbolical of *swine*; the *Boleyes* carry three bulls' heads, which reminds us of Cardinal *Wolsey's* pronunciation of the name in Shakespeare's *Henry VIII*, *Bullen* :

"Anne Bullen? No; I'll no Anne Bullens for him :  
There's more in't than fair visage.—Bullen !  
No, we'll no Bullens."—*King Henry VIII, Act iii.*

Not rarely the antiquity of such bearings is evidenced by the

\* See M. A. Lower, *Curiosities of Heraldry*, Chap. vi (London, 1845). An appropriate motto of one of these bearings was: "Non verbis sed *rebus* loquimur."

loss of the allusion in the current language, and recourse must be had to ancient and obsolete words to appreciate it. The English Harrisons display in their shield a hedgehog, which is to be explained by the French *hérisson*, and testifies to their Norman origin. The Sykes of the north of England show a fountain in their shield, whose significance is first ascertained on learning that in the Northumbrian dialect *syke* means a flowing spring or stream. The celebrated *fleurs-de-lys* of the royal house of France are traced back to the first Louis, whose name was pronounced *Loys*, and from the similarity of this to the common name of the flower, the latter was adopted as the charge on his shield.

Hundreds of such examples could be adduced, and the task of examining and analyzing them would not be an altogether vain one, as the principles upon which they were applied are the same which control the development of ikonomatic writing wherever we find it. But I pass from the consideration of these facts of general knowledge to the less known and much misunderstood forms of this writing which are presented in American archæology.

These are best exemplified in the so-called Mexican picture writing. For many years scholars have been divided in opinion whether this was purely ikonographic or partly phonetic. About forty years ago M. Aubin wrote an essay maintaining that it is chiefly phonetic, and laid down rules for its interpretation on this theory. But neither he nor any who undertook to apply his teachings succeeded in offering any acceptable renderings of the Aztec Codices. I am persuaded, however, that the cause of this failure lay, not in the theory of Aubin, but in the two facts, first, that not one of the students who approached this subject was well grounded in the Nahuatl language; and, secondly, that the principles of the interpretation of ikonomatic writing have never been carefully defined, and are extremely difficult, ambiguous and obscure, enough so to discourage any one not specially gifted in the solution of enigmas. At first, every identification is as puzzling as the effort to decipher an artificial rebus.

There are, indeed, some able scholars who still deny that any such phoneticism is to be found in Mexican pietography. To convince such of their error, and to illustrate the methods em-

ployed by these native American scribes, I will present and analyze several typical examples from Aztec manuscripts.

Beginning with proper names drawn from other languages, we find that the Nahuas had a number of such, which, of course, had no meaning in their own tongue. One of their documents speaks of the town of the Huastecas, called by that tribe *Tamuuch*, which means in their tongue "near the scorpions," and by the Aztecs, in imitation, *Tamuoc*.\* As the Huasteca is a Maya dialect, totally distinct from the Nahuatl, this word had no sense to the ears of the Aztecs. To convey its sound, they portrayed a man holding in his hands a measuring stick, and in the act of measuring. Now, in Nahuatl, the verb "to measure" is *tamachiua*; the measuring stick is *octocatl*; and, to make the latter plainer, several foot-prints, *xoctli*, are painted upon the measuring stick, giving an example of the repetition of the sound, such as we have already seen was common among the Egyptian scribes.



FIG. 1.—Tamuoc.

In another class of proper names, in their own tongue, although they had a meaning in the Nahuatl, the scribe preferred to express them by ikonomatic instead of ikonographic devices. Thus, *Mapachtepec*, means, literally, "badger hill," or "badger town," but in place of depicting a badger, the native writer made a drawing of a hand grasping a bunch of Spanish moss, the *Tillandsia usneoides*. The hand or arm in Nahuatl is *maill*, the moss *pachtli*: and taking the first syllables of these two words we obtain *mapach*: the word *tepec*, locative form of *tepetl*, hill or village, is expressed by the usual conventional ideographic or determinative sign.

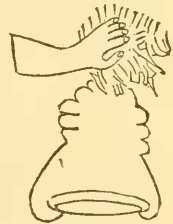


FIG. 2.—Mapachtepec.

In other names, the relative *position* of the objects are significant, reminding us of the rebus of a well known town in Massachusetts, celebrated for its educational institutions:

&

Mass.

\* *Tam*, near; *uch*, scorpion. *Diccionario Huasteca-Español*, MS., in my possession. This and most of the other instances quoted are to be found in Lord Kingsborough's great work on Mexico, and also in Dr. Peñafiel's *Catálogo Alfabético de los Nombres de Lugares pertenecientes al Idioma Nahuatl* (Mexico, 1885).

which is to be read, "Andover, Massachusetts," so in the Aztec scrolls, we have *itzmiquilpan* represented by an obsidian knife, *itztli*, and an edible plant, *quilitl*, which are placed above or over (*pan*), the sign for cultivated land, *milli*, thus giving all the elements of the name, the last syllable by position only.

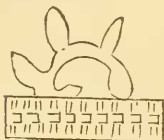


FIG. 3.—*Itzmiquilpan*.

In one respect I believe the ikonomatic writing of the Mexicans is peculiar; that is, in the phonetic value which it assigns to colors. Like the Egyptian, it is polychromatic, but, so far as I know, the Egyptian polychromes never had a phonetic value; they were, in a general way, used by that people as determinatives, from some supposed similarity of hue; thus green indicates a vegetable substance or bronze, yellow, certain woods and some animals, and so on. In heraldry the colors are very important and have well-defined significations, but very seldom, if ever, phonetic ones. Quite the contrary is the case with the Mexican script. It presents abundant instances where the color of the object as portrayed is an integral phonetic element of the sound designed to be conveyed.

To quote examples, the Nahuatl word for yellow is *cuztic* or *coztic*, and when the hieroglyphics express phonetically such proper names as *Acozpa*, *Cozamaloapan*, *Cozhuipilcan*, etc., the monosyllable *coz* is expressed solely by the yellow color which the scribe lays upon his picture.

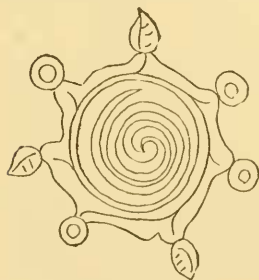


FIG. 4.—*Acozpa*.

Again, the name *Xiuhuacon*, "the place of grass," is represented by a circle colored pale blue, *hxiutic*. The name of this tint supplies the phonetic desired. The name of the village *Tlapan* is conveyed by a circle, whose interior is painted red, *tlapalli*, containing the mark of a human foot-print. Such examples are sufficient to prove that in undertaking to decipher the Mexican writing we must regard the color as well as the figure, and be prepared to allow to each a definite phonetic value.

It must not be understood<sup>1</sup> that all the Aztec writing is made up of phonetic symbols. This is far from being the case. We discover among the hundreds of curious figures which it pre-



sents, determinatives, as in the Egyptian inscriptions, and numerous ideograms. Sometimes the ideogram is associated with the phonetic symbol, acting as a sort of determinative to the latter. An interesting example of this is given at the beginning of the "Manuscripto Hieratico," recently published by the Spanish government\* It is the more valuable as an example, as the picture writing is translated into Nahuatl and written in Spanish

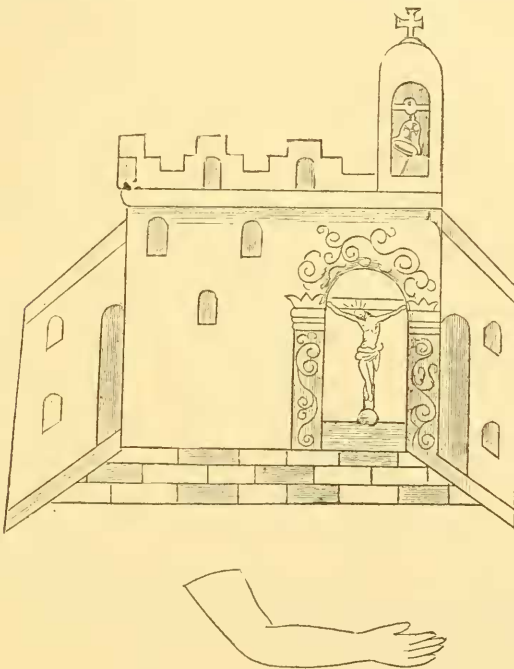


FIG. 5.—Tlamapa.

characters. The date of the document, 1526, leaves no doubt that it is in the same style as the ancient Codices. The page is headed with the picture of a church edifice; underneath is the outline of a human arm, and the legend in Nahuatl is:

*In Altepell y Santa Cruz Tlamapa.*

These words mean, "the town of Santa Cruz Tlamapa." The name "*tlamapa*" means "on the hillside," and doubtless originally

\* It is given in the appendix to the *Ensayo sobre la Interpretacion de la Escritura Hieratica de la America Central*, by De Rosny, translated by D. Juan de Dios de la Rada y Delgada (Madrid, 1884).

referred to the position in which the village was situated. But the prefix "*tlama*" usually signifies, "to do something with the arms or hands," derived from *maill*, hand or arm. Hence, the figure of the extended arm gives this dissyllable, *tlama*, which was sufficient to recall the name of the town.

The Aztecs by no means confined the ikonomatic system to proper names. They composed in it words, sentences, and treatises on various subjects. In proportion as it is applied to these connected and lengthy compositions, its processes become more recondite, curious and difficult of interpretation. Without a knowledge of the spoken language considerably more than rudimentary, it would be hopeless for the student to attempt to solve the enigmas which he meets at every step. Yet every well-directed effort will convince him that he is on the right track, and he will constantly be cheered and stimulated to further endeavor by the victories he will win day by day.

Few indeed have the requisite preliminary knowledge and the gift of insight into verbal puzzles to attain brilliant success. Among those who have pursued with marked and gratifying results this intricate study, it gives me pleasure to name Mrs. Zelia Nuttall Pinart. This lady has unraveled a number of the pages of the Vienna Codex and several of the monolithic inscriptions which have been handed down from ancient Mexico. With commendable caution she has refrained from publishing her results until they could be presented, supported by such proofs that they cannot be questioned; but, from a personal examination of them, I do not hesitate to say that they will be found to come up to the highest standard of scientific requirements.\*

The analogy which is presented in so many particulars between Mexican and Maya civilization would lead us to infer that the Maya writing, of which we have a number of examples well preserved, should be unlocked by the same key which has been successfully applied to the Aztec Codices. The latest writers on the Maya manuscripts, while agreeing that they are in part, at least, in phonetic characters, consider them mostly ideographic. But it is to be noted that not one of these writers has any practical acquaintance with the sounds of the Maya language, and

\* Several of Mrs. Pinart's interpretations were exhibited to the Anthropological Section of the American Association for the Advancement of Science at its last meeting (Buffalo, 1886), and were favorably received by the members.

scarcely any with its vocabulary. From this it is evident that even were these codices in ikonomatic writing, such investigators could make very little progress in deciphering them, and might readily come to the conclusion that the figures are not phonetic in any sense. Precisely the same position was taken by a number of students of Egyptian antiquity long after the announcement of the discovery of Champollion; and even within a few years works have been printed denying all phoneticism to the Nilotic inscriptions.

What induces me to believe that much of the Maya script is of the nature of the Mexican is the endeavor, undertaken for a very different purpose, of Professor Valentini to explain the origin of the so-called Maya alphabet, preserved by Bishop Landa, and printed in the editions of his celebrated "Description of Yucatan."\* Professor Valentini shows by arguments and illustrations, which I think are in the main correct, that when the natives were asked to represent the sounds of the Spanish letters in their method of writing, they selected objects to depict, whose names, or initial sounds, or first syllables, were the same, or akin, to the sounds of the Spanish vowel or consonant heard by them. Sometimes they would give several words, with their corresponding pictures, for the same sound; just as I have shown was the custom of the ancient Egyptians. Thus, for the sound *b* they drew a foot-print, which in their tongue was called *be*; for the sound *a* an obsidian knife, in Maya, *ach*, etc. Valentini thinks also that the letter *E* was delineated by black spots, in Maya *eeek*, meaning black, which, if proved by further research, would show that the Mayas, like the Mexicans, attributed phonetic values to the colors they employed in their painted scrolls.

Outside of the two nations mentioned, the natives of the American continent made little advance toward a phonetic system. We have no positive evidence that even the cultivated Tarascas and Zapotecs had anything better than ikonographs; and of the Quiches and Cakchiquels, both near relatives of the Mayas, we only know that they had a written literature of considerable ex-

\* Valentini's Essay appeared in the *Proceedings of the American Antiquarian Society*, April, 1880. Landa's work was originally published by the Abbe Bras-seur (de Bourbourg) at Paris, 1864, and more accurately at Madrid, 1884, under the supervision of Don Juan de Dios de la Rada y Delgada.

tent, but of the plan by which it was preserved we have only obscure hints. Next to these we should probably place the Chipe-way pictography, as preserved on their *meda* sticks, bark records, and *adjiljiatig* or grave-posts. I have examined a number of specimens of these, but have failed to find any evidence that the characters refer to sounds in the language; however, I should not consider it improbable that further researches should disclose some germs of the ikonomatic method of writing even in these primitive examples of the desire of the human intellect to perpetuate its acquisitions, and hand them down to generations yet unborn.

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*Synonymic List of the North American species of Bufo and Rana, with descriptions of some new species of Batrachia, from specimens in the National Museum. By E. D. Cope.*

(Read before the American Philosophical Society, October 1, 1886.)

BUFO Laur.

BUFO PUNCTATUS Baird & Girard, Proceedings Academy Philadelphia, 1852, p. 173. *Bufo beldingii* Yarrow, Proceedings U. S. National Museum, 1882, p. 441.

Sonoran and Lower Californian regions.

BUFO DEBILIS Girard, Proceedings Acad. Philadelphia 1854, p. 87.

*Bufo insidiosus* Girard, Proceedings Academy Philadelphia, 1854, p. 88. Sonoran region.

BUFO COLUMBIENSIS Baird & Girard, Proc. Ac. Phila., 1853, p. 378. *Bufo*

*boreas* Baird & Girard, Proc. Ac. Phila., 1852, p. 174. *Bufo halophila*

Baird & Girard, Proc. Ac. Phila., 1853, p. 301. *Bufo chilensis*, part,

Günth., Cat. Batr. Sal. Brit. Mus., 1868, p. 57. *Bufo microscaphus*

Cope, Proc. Ac. Phila., 1866, p. 301. *Bufo pictus* Cope, Report U.

S. G. G. Expl. W. of 100th Mer., v, p. 522, pl. xxv, f. 4-5.

Pacific region; Western Central region.

BUFO COMPACTILIS Wiegman, Isis, 1833, p. 661. *Anaxyrus melancholicus*

Tschudi, Faun. Per. Herp., p. 78, pl. ii, f. 5. *Bufo speciosus* Girard,

Proc. Ac. Phila., 1854, p. 86. *Bufo anomalus* Günth., Cat. Batr.

Salien. Brit. Mus., 1868, p. 57. *Bufo levifrons* Bocourt, Bull. Soc.

Philom. (7), i, p. 187. *Dromoplectrus anomalus* Camerano, Atti.

Acc. Tor., xiv, p. 882.

Mexican district; Texas.

BUFO ALVARIUS Girard, Baird's Reptilia, U. S. Mexican Boundary Survey.

ii, p. 26, pl. xli, f. 1-6.

Colorado Desert.